

2001 Chevrolet S10 Pickup

2001 STARTING & CHARGING SYSTEMS Generators & Regulators - Blazer, Bravada, Jimmy, Sonoma & S10 Pickup

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DESCRIPTION & OPERATION

WARNING: Vehicles are equipped with air bag supplemental restraint system. Before attempting any repairs involving steering column, instrument panel or related components, see **SERVICE PRECAUTIONS and DISABLING & ACTIVATING AIR BAG SYSTEM** in appropriate **AIR BAG RESTRAINT SYSTEMS** article.

CS130D (Charging System) series generator is rated at 100-amp output. See **GENERATOR SPECIFICATIONS** . The "130" designation is outside diameter of stator laminations, measured in millimeters. CS series generators include a delta stator, rectifier bridge, voltage regulator, dual internal cooling fans, and rotor with slip rings and brushes. A built-in regulator incorporates fault detection circuitry. See **Fig. 1** .

Generator operates with 2 wire connections and a ground path through mounting bracket. First wire connection is BAT output terminal. This terminal must be connected to battery during operation. Second wire connection is connected from generator internal regulator lamp driver to Powertrain Control Module (PCM) or Vehicle Control Module (VCM). This circuit monitors and controls generator operation.

Regulated voltage varies with temperature. System limits voltage by controlling rotor field current while field current is on. Regulator switches rotor field current on and off at a fixed frequency of 400 cycles per second to help control radio noise. By varying overall on/off time, correct average field current for proper system voltage control is obtained. At high speeds, with lower electrical loads, on-time may be 10 percent. At low speeds, with higher electrical loads, on-time may be as much as 90 percent.

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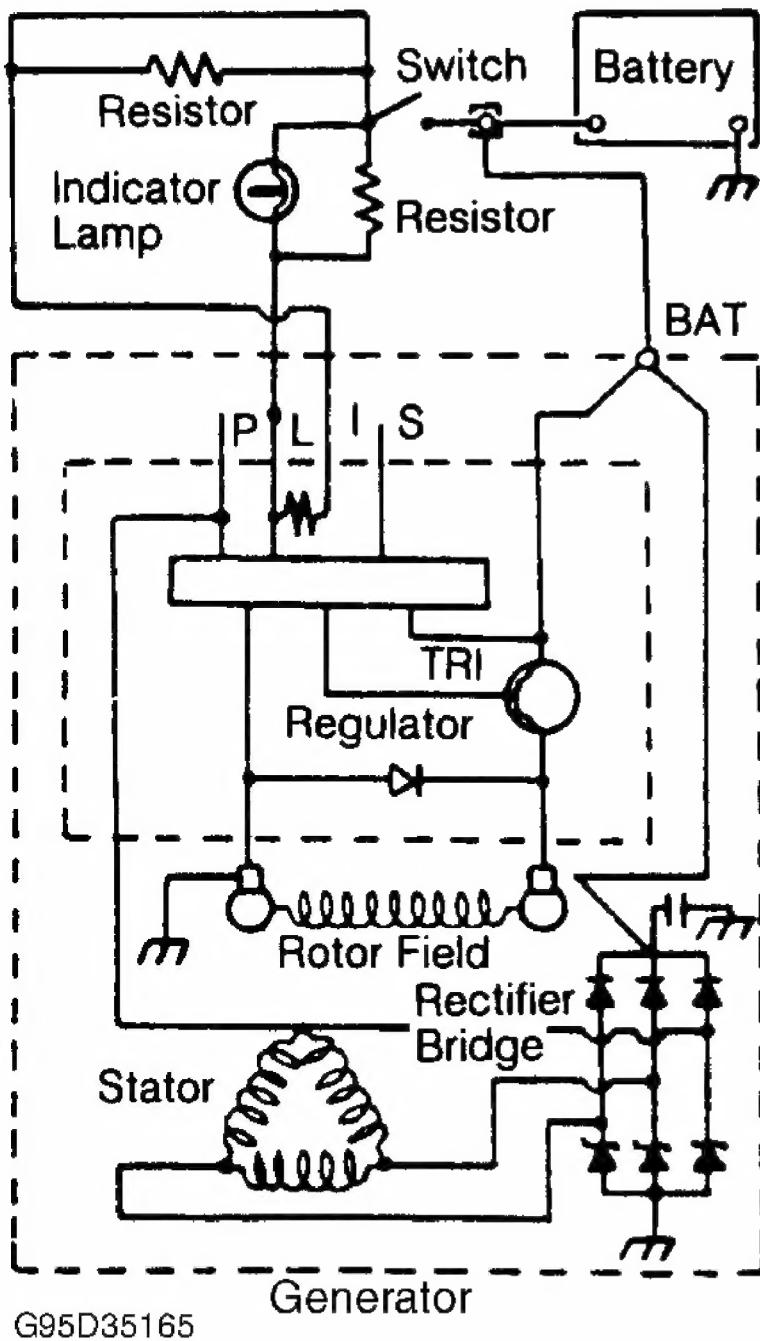


Fig. 1: Typical Charging System Wiring Schematic (CS130D Series)
Courtesy of GENERAL MOTORS CORP.

ADJUSTMENTS

BELT TENSION

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NOTE: Drive belt tension is controlled by a belt tensioner. No adjustment is required.

TROUBLE SHOOTING

NOTE: See TROUBLE SHOOTING article in GENERAL INFORMATION.

Verify customer complaint by operating system. Visually inspect for obvious signs of mechanical and electrical damage. Inspect for blown fuses. Inspect for loose or corroded connections, damaged wiring harnesses and/or switches. Check for a broken or partially broken wire inside insulation, which could cause system malfunction but prove good in a continuity/voltage check with system disconnected. Ensure any aftermarket electronic equipment is properly installed. If fault is found, repair as necessary. If no fault is found, perform self-diagnostics. See SELF-DIAGNOSTIC SYSTEM .

ON-VEHICLE TESTING

CAUTION: When battery is disconnected, vehicle computer and memory systems may lose memory data. Driveability problems may exist until computer systems have completed a relearn cycle. See COMPUTER RELEARN PROCEDURES article in GENERAL INFORMATION before disconnecting battery.

NOTE: Before making electrical checks, visually inspect all terminals for clean, tight connections. Ensure all charging system related fuses and fusible links are okay. Check generator mounting bolts and drive belt tension. Ensure battery is fully charged and in good condition prior to testing charging system. Ensure starter is okay. See appropriate STARTERS article.

NOTE: Manufacturer recommends using Universal CS Generator Tester (J-41450-B) for testing charging system. Follow instructions provided with tester.

BATTERY TESTING & INSPECTION

NOTE: Manufacturer recommends using Battery Tester (J-42000) for testing battery. Follow instructions provided with tester.

1. Inspect battery for a cracked, broken or damaged case. If battery case is okay, go to next step. If battery case is not okay, go to step 19 .

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2. Compare battery Cold Cranking Amperage (CCA) and Reserve Capacity (RC) rating to specifications. See **BATTERY SPECIFICATIONS** table. If battery meets or exceeds specifications, go to next step. If battery does not meet or exceed specifications, go to step 19 .

BATTERY SPECIFICATIONS

Application	Specification
Standard Battery	
Cold Cranking Amps	525
Reserve Capacity Rating	90 Minutes
Optional Battery	
Cold Cranking Amps	690
Reserve Capacity Rating	90 Minutes

3. Inspect battery hydrometer display. If hydrometer display shows a Yellow dot, go to next step. If hydrometer display does not show a Yellow dot, go to step 5 .
4. Using a small screwdriver, tap top of hydrometer display to dislodge any air bubbles inside. If hydrometer display still shows a Yellow dot, go to step 19 . If hydrometer display does not show a Yellow dot, go to next step.
5. Turn ignition switch to OFF position. Attempt to rotate negative battery cable connector clockwise with light finger pressure. If negative connector rotates, go to next step. If negative connector does not rotate, go to step 7 .
6. Using an INCH lb. torque wrench, record torque value while loosening negative battery cable bolt. If torque is equal to or greater than 88 INCH lbs. (10 N.m), go to step 8 . If torque is less than 88 INCH lbs. (10 N.m), go to next step.
7. Disconnect negative battery cable and go to step 9 .
8. Disconnect negative battery cable. Inspect battery and cable terminals for corrosion and defects. Repair as necessary. Go to next step.
9. Attempt to rotate positive battery cable connector clockwise with light finger pressure. If battery cable rotates, go to next step. If battery cable does not rotate, go to step [11](#) .
10. Using an INCH lb. torque wrench, record torque value while loosening positive battery cable bolt. If torque is equal to or greater than 88 INCH lbs. (10 N.m), go to step 12 . If torque is less than 88 INCH lbs. (10 N.m), go to next step.

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11. Disconnect positive battery cable and go to step 13 .
12. Disconnect positive battery cable. Inspect battery and cable terminals for corrosion and defects. If problem exists, repair as necessary. After repair, go to next step.
13. Clean and wire brush lead face of both battery terminals and metal contact surfaces on both cable connectors. Remove bolts from both battery cable connectors and inspect for corrosion and defects. Repair or replace as necessary. If battery and cables terminals are clean and in good condition, go to next step.
14. Connect positive battery cable to battery and tighten bolt to 11 ft. lbs. (15 N.m). After repair, go to next step.
15. Connect negative battery cable to battery and tighten bolt to 11 ft. lbs. (15 N.m). After repair, go to next step.
16. Ensure all electrical loads are off. Follow manufacturer's instructions and install Battery Tester (J-42000) to vehicle battery. Follow any instructions displayed on Battery Tester. If Battery Tester passed battery, go to next step. If Battery Tester did not pass battery, go to step 18 .
17. Press CODE button on Battery Tester. Record displayed code on vehicle repair order for warranty purposes. Battery is okay.
18. Press CODE button on Battery Tester. Record displayed code on vehicle repair order for warranty purposes. Replace battery.
19. Replace battery.

SELF-DIAGNOSTIC SYSTEM

NOTE: Diagnostic trouble code tests are written specifically for use with GM Tech I or Tech II scan tools. Generic scan tool can be used but may have limited functions. This article only covers the portion of those systems which relates to charging system diagnosis. For further information, see appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE.

ENGINE ELECTRICAL DIAGNOSTIC SYSTEM CHECK

1. Perform battery test and inspection. See **BATTERY TESTING & INSPECTION** under ON-VEHICLE TESTING. If battery passed test, go to next step. If battery did not pass test, replace battery.
2. Connect scan tool to Data Link Connector (DLC). DLC is located below left side of instrument panel. Turn ignition switch to RUN position. If scan tool powers up, go to next step. If scan tool does not power up, perform appropriate test in appropriate BODY CONTROL MODULES article in ACCESSORIES & EQUIPMENT.
3. Turn ignition switch to RUN position. Using scan tool, attempt to communicate with Body Control Module (BCM), Driver's Information Center (DIC), Instrument Panel

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Cluster (IPC) and Powertrain Control Module (PCM). If scan tool communicates with BCM, DIC, IPC and PCM, go to next step. If scan tool does not communicate with BCM, DIC, IPC and PCM, perform appropriate test in appropriate BODY CONTROL MODULES article in ACCESSORIES & EQUIPMENT.

4. Using scan tool, select DISPLAY DTCs function for each module. Record all DTCs displayed, DTC status and specific module which set DTC. If scan tool displays any DTCs, go to next step. If scan tool does not display DTCs, repair starting system by symptom. See **SYMPTOM INDEX** table under SYSTEM TESTS.
5. If scan tool displays DTCs which begin with "U", perform appropriate test in accordance with DTC retrieved. See appropriate BODY CONTROL MODULES article in ACCESSORIES & EQUIPMENT. If scan tool does not display DTCs which begin with "U", go to next step.
6. If scan tool displays DTCs which begin with "B", perform appropriate test in accordance with DTC retrieved. See appropriate BODY CONTROL MODULES article in ACCESSORIES & EQUIPMENT. If scan tool does not display DTCs which begin with "B", perform appropriate test in accordance with DTC retrieved. See **DIAGNOSTIC TROUBLE CODE DEFINITIONS**.

DIAGNOSTIC TROUBLE CODE DEFINITIONS

DIAGNOSTIC TROUBLE CODE DEFINITIONS

DTC ⁽¹⁾	Description
P0562	Low System Voltage
P0563	High System Voltage
P0621	High Or Low Generator Turn On Signal
P0622	⁽²⁾ Out Of Range Duty Cycle Signal
P1637	⁽²⁾ High Or Low Generator Turn On Signal
P1638	⁽²⁾ Out Of Range Duty Cycle Signal

(1) Codes listed in this table are only for testing covered in this article. For complete DTC listing, see appropriate BODY CONTROL MODULES article in ACCESSORIES & EQUIPMENT.

(2) On 4.3L Engines Only.

DIAGNOSTIC TESTS

DTC P0562: LOW SYSTEM VOLTAGE

1. If diagnostic system check was not performed, perform **ENGINE ELECTRICAL DIAGNOSTIC SYSTEM CHECK** under SELF-DIAGNOSTIC SYSTEM. If diagnostic system check was performed, go to next step.

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2. Using scan tool, observe Ignition 1 Signal voltage parameter in Powertrain Control Module (PCM) data list. If scan tool displays Ignition 1 Signal voltage greater than 10.5 volts, go to step 4 . If scan tool does not display Ignition 1 Signal voltage greater than 10.5 volts, go to next step.
3. Test PCM ignition feed circuit for high resistance or an open. If problem exists, repair circuit as necessary. After repair, go to step 7 . If problem does not exist, go to step 5 .
4. Inspect PCM harness connector for poor connections. If problem exists, repair as necessary. After repair, go to step 7 . If problem does not exist, go to step 6 .
5. Repair ignition feed circuit to PCM for short to ground. After repair, go to step 7 .
6. Replace PCM. See REMOVAL, OVERHAUL & INSTALLATION - TRUCKS article in ENGINE PERFORMANCE. Program PCM. After repair, go to next step.
7. Using scan tool, clear DTCs. Start engine and run vehicle above 5 MPH at 1200 RPM for 20 seconds. Check for DTC. If DTC P0562 resets, repeat test beginning at step 2 . If DTC P0562 does not reset, system is okay.

DTC P0563: HIGH SYSTEM VOLTAGE

1. If diagnostic system check was not performed, perform **ENGINE ELECTRICAL DIAGNOSTIC SYSTEM CHECK** under SELF-DIAGNOSTIC SYSTEM. If diagnostic system check was performed, go to next step.
2. Turn off all accessories. Start and run engine at 2000 RPM. Using DVOM, measure battery voltage at battery. If voltage is 19 volts or less, go to step 4 . If voltage is greater than 19 volts, go to next step.
3. Replace generator. See **GENERATOR** under REMOVAL & INSTALLATION. After repair, go to step 5 .
4. Replace PCM. See REMOVAL, OVERHAUL & INSTALLATION - TRUCKS article in ENGINE PERFORMANCE. Program PCM. After repair, go to next step.
5. Using scan tool, clear DTCs. Start engine and run vehicle above 5 MPH at 1200 RPM for 20 seconds. Check for DTC. If DTC P0563 resets, repeat test beginning at step 2 . If DTC P0563 does not reset, system is okay.

DTC P0621: HIGH OR LOW GENERATOR TURN ON SIGNAL

1. If diagnostic system check was not performed, perform **ENGINE ELECTRICAL DIAGNOSTIC SYSTEM CHECK** under SELF-DIAGNOSTIC SYSTEM. If diagnostic system check was performed, go to next step.
2. Connect scan tool to Data Link Connector (DLC). DLC is located below left side of instrument panel. Start and idle engine. Using scan tool, observe Generator L-Terminal parameter. If scan tool displays Inactive, go to next step. If scan tool does not display Inactive, go to step 4 .
3. Connect a test light between ground, and backprobe generator feed circuit (Red wire). If test light illuminates, go to next step. If test light does not illuminate, problem is

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intermittent. Check wiring and connections.

4. Inspect generator harness connector for poor connections. If problem does not exist, go to next step. If problem exists, repair as necessary. After repair, go to step 11 .
5. Turn ignition switch to OFF position. Disconnect Powertrain Control Module (PCM) connector C2. PCM is located at right front of engine compartment. Test Red wire for an open or high resistance between generator harness connector terminal "B" and PCM harness connector. See **WIRING DIAGRAMS** . If continuity exists, go to next step. If continuity does not exist, go to step 8 .
6. Test Red wire for an open or high resistance between generator connector terminal "B" and battery ground. If continuity exists, go to next step. If continuity does not exist, go to step 9 .
7. Inspect PCM harness connector for poor connections. If problem exists, repair as necessary. After repair, go to step 13 . If problem does not exist, go to step 9 .
8. Repair open or high resistance in generator circuit. See **WIRING DIAGRAMS** . After repair, go to step 13 .
9. Repair short to ground in generator circuit. See **WIRING DIAGRAMS** . After repair, go to step 13 .
10. Replace PCM. See REMOVAL, OVERHAUL & INSTALLATION - TRUCKS article in ENGINE PERFORMANCE. Program PCM. After repair, go to step 13 .
11. Disconnect generator harness connector. Start engine. Measure voltage between ground and generator connector terminal "B" (Red wire). If voltage is equal to or greater than 10 volts, go to step 13 . If voltage is not equal to or greater than 10 volts, go to next step.
12. Replace generator. See **GENERATOR** under REMOVAL & INSTALLATION. After repair, go to step 13 .
13. Using scan tool, clear DTCs. Start engine and run at 1000 RPM. Check for DTC. If DTC P0621 resets, repeat test beginning at step 2 . If DTC P0621 does not reset, system is okay.

DTC P0622: OUT OF RANGE DUTY CYCLE SIGNAL

1. If diagnostic system check was not performed, perform **ENGINE ELECTRICAL DIAGNOSTIC SYSTEM CHECK** under SELF-DIAGNOSTIC SYSTEM. If diagnostic system check was performed, go to next step.
2. Connect scan tool to Data Link Connector (DLC). DLC is located below left side of instrument panel. Start engine. Using scan tool, observe GEN F-Terminal parameter in Powertrain Control Module (PCM) data list. If scan tool indicates GEN F-Terminal Signal parameter is 5-95 percent, problem is intermittent. Check wiring and connections. If scan tool does not indicate GEN F-Terminal Signal parameter is 5-95 percent, go to next step.
3. Turn ignition switch to RUN position. Connect a test light to battery positive voltage.

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Repeatedly probe generator harness connector terminal "C" (Gray wire). while observing Generator Pulse Width Modulation (PWM) on scan tool. If Generator PWM display is affected, go to step 5 . If Generator PWM display is not affected, go to next step.

4. Inspect Gray wire for a short or open between generator harness connector terminal "C" and PCM harness connector. See **WIRING DIAGRAMS** . If problem exists, repair circuit as necessary. After repair, go to step 8 . If problem does not exist, go to step 6 .
5. Inspect generator harness connector for poor connections. If problem exists, repair as necessary. After repair, go to step 8 . If problem does not exist, perform **TEST A: CHARGING SYSTEM TEST** under SYSTEM TESTS.
6. Inspect PCM harness connector for poor connections. If problem exists, repair as necessary. After repair, go to step 8 . If problem does not exist, go to next step.
7. Replace PCM. See REMOVAL, OVERHAUL & INSTALLATION - TRUCKS article in ENGINE PERFORMANCE. Program PCM. After repair, go to next step.
8. Review and record scan tool Fail Records data. Using scan tool, clear DTCs. Operate vehicle within Fail Records conditions as noted. Check for DTC. If DTC P0622 resets, repeat test beginning at step 2 . If DTC P0622 does not reset, system is okay.

DTC P1637: HIGH OR LOW GENERATOR TURN ON SIGNAL

1. If diagnostic system check was not performed, perform **ENGINE ELECTRICAL DIAGNOSTIC SYSTEM CHECK** under SELF-DIAGNOSTIC SYSTEM. If diagnostic system check was performed, go to next step.
2. Connect scan tool to Data Link Connector (DLC). DLC is located below left side of instrument panel. Start and idle engine. Using scan tool, observe Generator L-Terminal parameter. If scan tool displays Inactive, go to next step. If scan tool does not display Inactive, go to step 4 .
3. Connect test light between ground and generator connector BAT terminal. See **WIRING DIAGRAMS** . If test light illuminates, go to next step. If test light does not illuminate, problem is intermittent. Check wiring and connections.
4. Inspect generator harness connector for poor connections. If problem exists, repair as necessary. After repair, go to step 11 . If problem does not exist, go to next step.
5. Turn ignition switch to OFF position. Disconnect PCM connector C2. PCM is located at right side of engine compartment. Using DVOM, test Red wire for high resistance or open between PCM harness connector and generator harness connector terminal "B". See **WIRING DIAGRAMS** . If DVOM indicates continuity, go to next step. If DVOM does not indicate continuity, go to step 8 .
6. Using DVOM, test Red wire between generator harness connector "B" terminal and battery ground. See **WIRING DIAGRAMS** . If DVOM indicates continuity, go to next step. If DVOM does not indicate continuity, go to step 9 .
7. Inspect PCM harness connector for poor connections. If problem exists, repair as necessary. After repair, go to step 13 . If problem does not exist, go to step 9 .

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8. Repair open or high resistance in generator circuit. See **WIRING DIAGRAMS** . After repair, go to step 13 .
9. Repair short to ground in generator circuit. See **WIRING DIAGRAMS** . After repair, go to step 13 .
10. Replace PCM. See REMOVAL, OVERHAUL & INSTALLATION - TRUCKS article in ENGINE PERFORMANCE. Program PCM. After repair, go to next step.
11. Disconnect generator harness connector. Start engine. Measure voltage between ground and generator connector "B" terminal (Red wire). If voltage is equal to or greater than 10 volts, go to step 13 . If voltage is not equal to or greater than 10 volts, go to next step.
12. Replace generator. See **GENERATOR** under REMOVAL & INSTALLATION. After repair, go to step 13 .
13. Using scan tool, clear DTCs. Start vehicle and run at greater than 1000 RPM. Check for DTC. If DTC P1637 resets, repair test beginning at step 2 . If DTC P1637 does not reset, system is okay.

DTC P1638: OUT OF RANGE DUTY CYCLE SIGNAL

1. If diagnostic system check was not performed, perform **ENGINE ELECTRICAL DIAGNOSTIC SYSTEM CHECK** under SELF-DIAGNOSTIC SYSTEM. If diagnostic system check was performed, go to next step.
2. Connect scan tool to Data Link Connector (DLC). DLC is located below left side of instrument panel. Start engine. Using scan tool, observe GEN F-Terminal parameter in Powertrain Control Module (PCM) data list. If scan tool indicates GEN F-Terminal parameter is 5-95 percent, problem is intermittent. Check wiring and connections. If scan tool does not indicate GEN F-Terminal is 5-95 percent, go to next step.
3. Turn ignition switch to RUN position. Connect test light to battery positive voltage. Repeatedly probe generator harness connector terminal "C" (Gray wire), while observing Generator Pulse Width Modulated (PWM) on scan tool. If Generator PWM display is affected, go to step 5 . If Generator PWM display is not affected, go to next step.
4. Test Gray wire for a short or an open between generator harness connector terminal "C" and PCM harness connector. See **WIRING DIAGRAMS** . If problem exists, repair circuit as necessary. After repair, go to step 8 . If problem does not exist, go to step 6 .
5. Inspect generator harness connector for poor connections. If problem exists, repair as necessary. After repair, go to step 8 . If problem does not exist, perform **TEST A: CHARGING SYSTEM TEST** under SYSTEM TESTS.
6. Inspect PCM harness connector for poor connections. If problem exists, repair as necessary. After repair, go to step 8 . If problem does not exist, go to next step.
7. Replace PCM. See REMOVAL, OVERHAUL & INSTALLATION - TRUCKS article

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in ENGINE PERFORMANCE. Program PCM. After repair, go to next step.

8. Review and record scan tool Fail Records data. Using scan tool, clear DTCs. Operate vehicle under conditions noted in Fail Records. Check for DTC. If DTC P1638 resets, repeat test beginning at step 2 . If DTC P1638 does not reset, system is okay.

SYSTEM TESTS

SYMPTOM INDEX

Symptom	Perform Test
Charging System Test	<u>A</u>
Charge Indicator Always On	<u>B</u>
Charge Indicator Inoperative	<u>C</u>
Generator Noise Diagnosis	<u>D</u>

TEST A: CHARGING SYSTEM TEST

1. If diagnostic system check was not performed, perform **ENGINE ELECTRICAL DIAGNOSTIC SYSTEM CHECK** under SELF-DIAGNOSTIC SYSTEM. If diagnostic system check was performed, go to next step.
2. Start engine and observe charge indicator on Instrument Panel Cluster (IPC) or message on Driver's Information Center (DIC). If charge indicator illuminates or DIC displays a charging system message, go to next step. If charge indicator does not illuminate or DIC does not display a charging system message, problem is intermittent. Check wiring and connections.

NOTE: **Green POWER light of tester should remain illuminated while tester is being used.**

3. Turn ignition switch to OFF position. Using CS Generator Tester (J-41450-B), connect Red lead to generator output terminal and Black lead to metal generator housing. If Green POWER light does not illuminate, go to next step. If Green POWER light illuminates, go to step 6 .
4. Using a DVOM, measure voltage between output terminal of generator and generator metal housing. If battery voltage exists, go to step 14 . If battery voltage does not exist, go to next step.
5. Using a DVOM, measure voltage between output terminal of generator and battery negative terminal. If battery voltage exists, go to step 12 . If battery voltage does not exist, go to step 11 .

CAUTION: Ensure load is completely turned off before connecting or disconnecting carbon pile load tester to battery.

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6. Connect carbon pile tester to battery. Connect inductive ammeter to output circuit of generator. Disconnect generator harness connector. Locate matching harness connector on CS Generator Tester (J-41450-B) and connect it to generator. If Red DIAGNOSTIC light illuminates, go to next step. If Red DIAGNOSTIC light does not illuminate, go to step 13 .
7. Start engine and allow to idle for 30 seconds. Increase engine speed to 2500 RPM. If Red DIAGNOSTIC light does not illuminate, go to next step. If Red DIAGNOSTIC light illuminates, go to step 15 .

NOTE: **If generator is not capable of producing load test amps, operate generator at possible maximum output.**

8. Maintain engine speed at 2500 RPM. Turn on load of carbon pile tester and increase load until load is equal to test value of generator to 70 amps. If Red DIAGNOSTIC light does not illuminate, go to next step. If Red DIAGNOSTIC light illuminates, go to step 15 .
9. Maintain engine speed at 2500 RPM and continue to operate generator at load test value. Using a DVOM, measure voltage drop between generator output terminal and positive battery terminal. If voltage drop is 0.5 volt or less, go to next step. If voltage drop is greater than 0.5 volt, go to step 11 .
10. Maintain engine speed at 2500 RPM and continue to operate generator at load test value. Using a DVOM, measure voltage drop between generator metal housing and negative battery terminal. If voltage drop is 0.5 volt or less, go to step 16 . If voltage drop is greater than 0.5 volt, go to step 12 .
11. Repair high resistance or open in generator output circuit. See **WIRING DIAGRAMS** . After repair, go to step 16 .
12. Repair high resistance or open in ground circuit of generator. See **WIRING DIAGRAMS** . After repair, go to step 16 .
13. Disconnect J-41450-B tester harness connector from generator, but leave alligator clips connected so Green POWER light remains illuminated. Connect a jumper wire with an in-line 100-ohm resistor between CS Generator Tester harness connector terminal "B" and a good ground. If Red DIAGNOSTIC light illuminates, go to step 15 . If Red DIAGNOSTIC light does not illuminate, go to next step.
14. If a problem exists with CS Electronic Generator Tester (J-41450-B). Refer to manufacturer's instructions, how to test J-41450-B for proper operation. If tester has been repaired or replaced, go to step 3 .
15. Replace generator. See **GENERATOR** under REMOVAL & INSTALLATION. After repair, go to next step.
16. Operate system to verify repair. If system is not operating correctly, repeat test beginning at step 2 .

TEST B: CHARGE INDICATOR ALWAYS ON

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1. If diagnostic system check was not performed, perform **ENGINE ELECTRICAL DIAGNOSTIC SYSTEM CHECK** under SELF-DIAGNOSTIC SYSTEM. If diagnostic system check was performed, go to next step.
2. Turn ignition switch to RUN position. Observe charge indicator on Instrument Panel Cluster (IPC). If charge indicator illuminates, go to next step. If charge indicator does not illuminate, problem is intermittent. Check wiring and connections.
3. Turn ignition switch to OFF position. Disconnect generator harness connector. Turn ignition switch to RUN position. If charge indicator remains illuminated, go to next step. If charge indicator does not remain illuminated, go to step 5 .
4. Test charge indicator control circuit for a short to ground. See **WIRING DIAGRAMS** . If problem exists, repair as necessary. After repair, go to step 7 . If problem does not exist, go to step 6 .
5. Replace generator. See **GENERATOR** under REMOVAL & INSTALLATION. After repair, go to step 7 .
6. Replace Powertrain Control Module (PCM). See REMOVAL, OVERHAUL & INSTALLATION - TRUCKS article in ENGINE PERFORMANCE. Program PCM. After repair, go to next step.
7. Operate system to verify repair. If system is not operating correctly, repeat test beginning at step 3 .

TEST C: CHARGE INDICATOR INOPERATIVE

1. If diagnostic system check was not performed, perform **ENGINE ELECTRICAL DIAGNOSTIC SYSTEM CHECK** under SELF-DIAGNOSTIC SYSTEM. If diagnostic system check was performed, go to next step.
2. Turn ignition switch to RUN position. Observe charge indicator on Instrument Panel Cluster (IPC). If the charge indicator illuminates, problem is intermittent. Check wiring and connections. If charge indicator does not illuminate, go to next step.
3. Replace IPC. See appropriate ANALOG INSTRUMENT PANELS article in ACCESSORIES & EQUIPMENT. After repair, go to next step.
4. Operate system to verify repair. If system is not operating correctly, repeat test beginning at step 2 .

TEST D: GENERATOR NOISE DIAGNOSIS

1. Perform charging system check. See **TEST A: CHARGING SYSTEM TEST** . If generator operates properly, go to next step. If generator does not operate properly, go to step 11 .
2. Start engine. Verify that generator noise can be heard. Turn ignition switch to OFF position. Disconnect generator 4-pin harness connector. Start engine. Listen for generator noise. If noise does not exist, go to step 11 . If noise exists, go to next step.
3. Turn ignition switch to OFF position. Remove drive belt. Spin generator pulley by

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- hand. If pulley rotates smoothly and noise does exist, go to next step. If pulley rotates roughly and/or noise exists, go to step 11 .
4. Inspect pulley for looseness, or loose pulley nut. If pulley and nut are okay, go to next step. If pulley and/or nut is loose, go to step 11 .
 5. Loosen all generator mounting bolts. On 2.2L, tighten rear generator bolt to 37 ft. lbs. (50 N.m). Tighten front generator bolt to 18 ft. lbs. (24 N.m). On 4.3L tighten bolts to 37 ft. lbs. (50 N.m). Install drive belt. Start engine and listen for noise. If noise has decreased or stopped, system is okay. If noise still exists, go to next step.
 6. Check for stretched generator connections, or hoses or other equipment rubbing on generator. If problem exists, repair as necessary. After repair, go to next step. If problem does not exist, go to step 8 .
 7. Reroute electrical connections, hoses, etc., away from generator. Start engine and listen for noises. If noise has decreased or stopped, system is okay. If noise still exists, go to next step.
 8. Check drive belt for proper tension. If drive belt is loose, go to next step. If drive belt is okay, go to step 10 .
 9. Replace drive belt tensioner. Start engine and listen for noise. If noise has decreased or stopped, system is okay. If noise still exists, go to step 11 .
 10. Check comparable vehicle for similar noise. If noise exists in similar vehicle, system is okay. If noise does not exist in similar vehicle, go to next step.
 11. If no definite generator problems were found, ensure all other possible sources of noise are eliminated. If all possibilities have been eliminated, replace generator. See **GENERATOR** under REMOVAL & INSTALLATION. After repair, go to next step.
 12. Start engine and verify that noise is reduced or eliminated. If noise is still objectionable, go to step 2 .

BENCH TESTING

NOTE: Bench testing procedures are not available from manufacturer.

REMOVAL & INSTALLATION

WARNING: Vehicles are equipped with air bag supplemental restraint system. Before attempting any repairs involving steering column, instrument panel or related components, see **SERVICE PRECAUTIONS and DISABLING & ACTIVATING AIR BAG SYSTEM** in appropriate **AIR BAG RESTRAINT SYSTEMS** article.

CAUTION: When battery is disconnected, vehicle computer and

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memory systems may lose memory data. Driveability problems may exist until computer systems have completed a relearn cycle. See COMPUTER RELEARN PROCEDURES article in GENERAL INFORMATION before disconnecting battery.

GENERATOR

Removal & Installation

1. Disconnect negative battery cable. Remove drive belt. On 2.2L engines, raise and support vehicle. Working through wheel well, remove rear generator brace from engine. Remove nut and positive battery cable from generator BAT terminal. Disconnect generator electrical connector. Remove 2 generator mounting bolts. Remove generator.
2. On 4.3L engines, remove heater hose bracket bolt from generator. Remove 2 generator mounting bolts. Remove generator from mounting bracket. Disconnect generator electrical connector. Remove nut and positive battery cable from generator BAT terminal. Remove generator.
3. On all models, reverse removal procedure to install. Tighten nuts and bolts to specification. See **TORQUE SPECIFICATIONS**.

OVERHAUL

NOTE: CS130D generator is non-repairable and is serviced by replacement only.

GENERATOR SPECIFICATIONS

GENERATOR SPECIFICATIONS

Generator	Rated AMP Output	Load Test AMP Output
CS130D	100	70

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Application	Ft. Lbs. (N.m)
2.2L Engine	
Battery Output BAT Terminal Nut	12 (17)
Brace-To-Engine Stud Nut	37 (50)
Front Bolt	18 (25)
Generator Rear Brace-To-Generator Bolt	18 (25)

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Generator Rear Brace-To-Air Intake Plenum Stud Nut	18 (25)
Rear Bolt	37 (50)
4.3L Engine	
Battery Output BAT Terminal Nut	12 (17)
Generator Bolt	37 (50)
Heater Hose Bracket-To-Generator Bolt	18 (25)

WIRING DIAGRAMS

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